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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KASHNIKOW, ERIK

ART UNIT

PAPER NUMBER

1794

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,369	Applicant(s) SHIRATORI ET AL.	
	Examiner ERIK KASHNIKOW	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 6, 13-25 and 27-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-5, 7-12 and 26 in the reply filed on 11/06/08 is acknowledged.
2. Claims 6, 13-25 and 27-41 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method and article, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11/06/08.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. The term "high-molecular" in claims 10 and 11 is a relative term which renders the claim indefinite. The term "high molecular" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

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Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 7, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,586,791).

8. In regards to claims 1, 3 and 5 Lee et al. teach a transistor comprising a gate electrode, an insulating layer, a source electrode and a semiconductor layer (claim 1). Lee et al. teach that the semiconducting layer comprise at least one of Copper phthalocyanine, polypyrrole and polyaniline (claim 20), as the claim language is at least one, this includes embodiments wherein both an organic material and a sensitizing dye are present. Lee et al. further teach an embodiment wherein these materials are directly bonded to an inorganic layer (column 8 lines 55-65). While Lee et al. are silent regarding the term heterostructure, all the requirements for a heterostructure are met by Lee et al. While Lee et al. are silent with regards to the concentrations of the copper phthalocyanine in the semiconductor layer it has been found that absent a showing of criticality with respect to "copper phthalocyanine concentration" (a result effective variable), it would have been obvious to a person of ordinary skill in the art at the time of the invention to adjust the " copper phthalocyanine concentration " through routine experimentation to values, including those presently claimed in order to achieve "an effective semiconductive layer". It has been held that discovering an optimum value of

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a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It has long been an axiom of United States patent law that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003) ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art."); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955) ("[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."). "Only if the 'results of optimizing a variable' are 'unexpectedly good' can a patent be obtained for the claimed critical range." *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (quoting *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977)).

9. In regards to claim 2 as copper phthalocyanine is the same sensitizing dye as preferred by Applicant's it would intrinsically exhibit light absorption in the visible light range.

10. In regards to claim 4 and 10 the Polypyrrole and polyaniline are aromatic compounds. Since these compounds are preferred compounds of Applicant they would also intrinsically be high molecular compound

11. In regards to claims 1, 5, 7 and 8 Examiner is treating it as a product by process claim, specifically regarding the term "formed by". It has been shown that even though

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product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process (MPEP 2113 and *In re Thorpe*, 777F.2d 695, 698, 227 USPQ 964, 966).

12. Claims 1, 2, 4, 5, 7-9 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chidsey et al. (US 5,217,792).

13. In regards to claims 1, 5 and 26 Chidsey et al. teach layered films for use in optical devices (column 1 lines 6-9). Chidsey et al. teach that the films comprise an organic layer bonded to a metallic layer, wherein the organic layer comprises a dye material (column 2 lines 5-20). Chidsey et al. teach that the films are formed using a self assembly feature (column 3 lines 14-15).

14. In regards to claim 2 Chidsey et al. teach that the dye absorbs light at wavelengths between 0-800 nanometers, which includes the visible light wavelengths (column 4 lines 40-44).

15. In regards to claim 4 Chidsey et al. teach that the organic layer contains an aromatic compound (column 6 lines 3-10).

16. In regards to claims 7 and 8 Examiner is treating it as a product by process claim, specifically regarding the term "formed by". It has been shown that even though product-by-process claims are limited by and defined by the process, determination of

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patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process (MPEP 2113 and *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966). While Chidsey et al. are silent with regards to the concentrations of the dye in the organic layer it has been found that absent a showing of criticality with respect to "dye concentration" (a result effective variable), it would have been obvious to a person of ordinary skill in the art at the time of the invention to adjust the "copper phthalocyanine concentration" through routine experimentation to values, including those presently claimed in order to achieve "an optimal nonlinear susceptibilities (column 1 lines 25-30)". It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It has long been an axiom of United States patent law that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003) ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art."); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955) ("[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the

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optimum or workable ranges by routine experimentation."). "Only if the 'results of optimizing a variable' are 'unexpectedly good' can a patent be obtained for the claimed critical range." *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (quoting *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977)).

17. In regards to claim 9 Chidsey et al. teach that the films are alternatively layered to each other (column 2 lines 6-26).

18. Claims 3, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chidsey et al. (US 5,217,792) in view of Harima et al. (US 5,169,672).

19. As stated above Chidsey et al. teach a film which comprises an organic layer with a dye and an inorganic layer, however they are silent regarding a titanium containing inorganic layer as well as copper phthalocyanine as the dye.

20. Harima et al. teach thin films containing various dyes (column 2 lines 28-30) which are for use in optical devices (column 12 lines 41-46).

21. In regards to claims 3 and 10 Harima et al. teach that the thin film comprise hydrophobic organic substances, such as polypyrrole and polyaniline (column 2 lines 60-67) which since these compounds are preferred compounds of Applicant, they would also intrinsically be high molecular compound. Harima et al. further teach that the hydrophobic organic substance further comprise a phthalocyanine, specifically copper phthalocyanine (column 3 lines 32-35).

22. In regards to claim 12 Harima et al. teach the film containing the dye is attached to a layer comprising TiO₂ (column 12 lines 1-14).

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23. One of ordinary skill in the art at the time of the invention would be motivated to modify the invention of Chidsey et al. with that of Harima et al. because the invention of Harima et al. offers the ability to form good color filtration for a wide variety of devices (column 12 lines 25-55).

24. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chidsey et al. (US 5,217,792) in view of Rubner et al. (US 5,536,573).

25. As stated above Chidsey et al. teach a film which comprises an organic layer with a dye and an inorganic layer, however they are silent regarding alternate adsorption of aromatic layers and carboxylic layers.

26. In regards to claim 11 Rubner et al. teach that films with good optical properties are formed by an alternate adsorption method of polyaniline and polypyrrole with a polyanion (column 1 lines 14-20 and column 6 lines 50-62). Rubner et al. further teach that the polyanion may be polyacrylic or polymethacrylic acid (column 9 lines 24-30).

27. One of ordinary skill in the art at the time of the invention would be motivated to modify the invention of Chidsey et al. with that of Rubner et al. because the invention of Rubner et al. offers high electrical conductivity and environmental stability (column 3 lines 14-20).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP 10-180933 A teaches sol gel formation methods and contains more information on alternate adsorption methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIK KASHNIKOW whose telephone number is (571)270-3475. The examiner can normally be reached on Monday-Friday 7:30-5:00PM EST (Second Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Erik Kashnikow
Examiner
Art Unit 1794

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794